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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/063,958	05/29/2002	Akira Koseki	JP920010018US1	2376

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IBM CORPORATION, T.J. WATSON RESEARCH CENTER
P.O. BOX 218
YORKTOWN HEIGHTS, NY 10598

EXAMINER	
KENDALL, CHUCK O	

ART UNIT	PAPER NUMBER
2192	

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/063,958	KOSEKI ET AL.	
	Examiner	Art Unit	
	Chuck Kendall	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 29 May 2002.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-17 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-17 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the application filed 05/29/2002

2. Claims 1 – 17 were presented and have been examined.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3, & 5 – 7 and 11 are rejected under 35 U.S.C. 112; second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, Applicant recites "...allocation is done, so that logical registers that are live across a procedure call at which fewer logical registers are live at the same time..." this language is vague and indefinite. Examiner is not able to ascertain any plausible meaning or understanding of Applicant's claimed limitations.

In claim 5, Applicant recites, " when a different procedure is called in a predetermined procedure...", here Examiner can only assume that a first procedure is first called before attempting a different procedure, however it isn't identified or claimed.

In claim 6, Applicant recites, "...calling said different procedures include...". As stated above a first procedure was never called. There is insufficient antecedent basis for this limitation in the claim.

Also in claims 5, 7, and 11, Applicant claims, "...restoring the register image ..." there is insufficient antecedent basis for this limitation in the claim.

Claim interpretations

Regarding claim 3, for compact execution, Examiner is interpreting the logical registers being allocated to be an available (live) physical register.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 – 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Koblenz et al. USPN 5,530,866.

Regarding claim 1, Koblenz anticipates a compiling method (20:5 – 24:35, see implemented method), program (4: 33 – 35, see hierarchial program), computer (20: 7, see target computer), and medium (5:64, see physical register) for converting into object code a program written in source code comprising the steps of:

allocating registers for a program to be compiled (4:47 – 50); and

generating object code based on the register allocation, wherein said step of allocating registers includes the steps of allocating logical registers (pseudo registers) for instructions in said program, and performing mapping between said logical registers and physical registers so that said physical registers that are live at a procedure call in said program to be compiled are allocated from the bottom of the register stack (4:47 –

50, for logical registers see pseudo registers, for bottom also see 4:32 – 40, for bottom up phase, which refers to stack).

Regarding claim 2, the compiling method according to claim 1, wherein, at said mapping step, allocation is done so that logical registers that are live across more procedure calls are first allocated (5:56 – 63, see initially assigned to pseudo register).

Regarding claim 3, the compiling method according to claim 1, wherein, at said mapping step, allocation is done, so that logical registers that are live across a procedure call at which fewer logical registers are live at the same time are first allocated (5:56 – 63, see initially assigned to pseudo register, same as first allocated, also see 12:47 – 50, for "if the preferred register is available").

Regarding claim 4, Koblenz anticipates a code generation method for generating code for a program that controls a computer comprising the steps of:

generating code while confirming that registers are allocated for a predetermined instruction (7:5 – 10); and

upon the calling of the procedure, so long as there is a vacancy in operation resources, copying said registers residing in the register stack, to free registers located at the bottom of said register stack (7:18 – 23, see pseudo register allocation and spill decisions i.e. live analysis for spilling, see definition of spill as defined on 6: 40 – 50).

Regarding claim 5, Koblenz anticipates a method, for employing a stack register when a processor with a register stack executes a program, comprising the steps of:

when a different procedure is called in a predetermined procedure, reallocating registers that are allocated for the execution of said predetermined procedure and are live when said different procedure is called, and calling said different procedure (12:44 – 50, for live, see if preferred register is available); and

upon the return from said different procedure, restoring the register image to the state immediately before the reallocation (19:21 – 25, see save and restore).

Regarding claim 6, the stack register employment method according to claim 5, wherein said step of reallocating said registers and calling said different procedure includes the steps of:

sorting and reallocating, from the bottom of said register stack, said registers that are live when said different procedure is called (4:1 – 8, see determining (sorting) spill operations and memory reference at each point, also refer to bottom up phase in lines 32 – 34).

Regarding claim 7, Koblenz anticipates a method, for employing a stack register when a program is executed by a processor with a register stack, comprising the steps of:

each time a procedure is called, packing and allocating existing logical registers (23: 7 – 13, see assigning to pseudo registers);

performing said procedure, and restoring the register image to the state before the packing(19:21 – 25, see save and restore).

Regarding claim 8, which claims the compiler version of claim 1, see rationale above as previously discussed.

Regarding claim 9, the compiler according to claim 8, wherein said register allocator allocates said logical registers and said physical registers first for an important portion of said program to be compiled (4:47 – 50); and

wherein, while for a less important portion of said program, said code generator generates compensation code for allocation of said logical registers and for allocation of said physical registers for the important portion (4:25 – 32, for important portion see heavy access).

Regarding claim 10, which recites similarly as already discussed claim 1, see reasoning above.

Regarding claim 11, which recites the computer version of claim 5, see rationale above as previously discussed.

Regarding claim 12, which recites the program version of claim 1, see rationale above as previously discussed.

Regarding claim 13, which recites the program version of claim 4, see rationale above as previously discussed.

Regarding claim 14, which recites the program version of claim 5, see rationale above as previously discussed.

Regarding claim 15, which recites the storage medium version of claim 1, see rationale above as previously discussed.

Regarding claim 16, which recites the program version of claim 4, see rationale above as previously discussed.

Regarding claim 17, which recites the storage medium version of claim 5, see rationale above as previously discussed.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Odnert et al. USPN 5,555,417 (Patent date, 09/10/96).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chuck Kendall whose telephone number is 571-272-3698. The examiner can normally be reached on 10:00 am - 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam can be reached on 571-272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ck.

TUAN DAM
SUPERVISORY PATENT EXAMINER